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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: H. KANAI, et al

Serial No.: 10/773,345

Filed: February 9, 2004

For: STORAGE CONTROL APPARATUS AND METHOD THEREOF

**PETITION TO MAKE SPECIAL
UNDER 37 CFR 1.102(d) and MPEP. §708.02, VIII**

MS Petition

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

September 14, 2004

Sir:

1. Petition

Applicants hereby petition to make this application **Special**, in accordance with 37 CFR §1.102(d) and MPEP 708.02, VIII. The present invention is a new application filed in the United States Patent and Trademark Office on February 9, 2004 and as such has not received any examination by the Examiner.

2. Claims

Applicants hereby represent that all the claims in the present application are directed to a single invention. If upon examination it is determined that all the claims presented are not directed to a single invention, Applicants will make an election without traverse as a prerequisite to the granting of special status.

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3. Search

Applicants hereby submit that a pre-examination search, a copy of which is attached, has been made by a professional searcher.

The field of search covered:

<u>Class</u>	<u>Subclasses</u>	<u>Description</u>
365/		STATIC INFORMATION STORAGE AND RETRIEVAL
	189.01	READ/WRITE CIRCUIT
	189.04	.. Simultaneous operations (e.g., read/write)
	230.01	ADDRESSING
	230.04	.. Alternate addressing (e.g., even/odd)
711/		ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS: MEMORY
100		STORAGE ACCESSING AND CONTROL

The above subclasses represent areas deemed to contain subject matter of interest to one or more of the search features. Please note that relevant references may be classified outside of these areas. The integrity of the search is based on the records as presented to us by the United States Patent and Trademark Office (USPTO). No further integrity studies were performed. Also, a key word search was performed on the USPTO full-text database including published U.S. patent applications.

4. Copy of References

A listing of all references found by the professional searcher is provided by a Form PTO-1449 and copies of the references and the Form PTO-1449 are submitted as part of an Information Disclosure Statement (IDS) filed on even date.

5. Detailed Discussion of the References and Distinctions Between the References and the Claims

Below is a discussion of the references uncovered by the search and cited in the

IDS filed on even date that appear to be most closely related to the subject matter encompassed by the claims of the present application, and which discussion particularly points out how Applicants' claimed subject matter is distinguishable over those references. All other references uncovered by the search and cited in the IDS filed on even date are **not** treated in detail herein.

a. Detailed Discussion of the References

Kitta et al. (U.S. Patent No. 5,860,026), provides for an Information Processing System for Controlling Operations of Input/Output Devices of Another Cluster According to Control Instructions Issued from a Cluster. As illustrated in Figs. 1 and 3-5 a first cluster issues a control instruction for controlling an input/output device of a second cluster. The second cluster in response to the instruction, the second cluster executes processing with the input/output device thereof and returns a result of the processing to the first cluster. The data transfer processing device 15 mounted on each cluster comprises a buffer 158, a buffer control unit 158 and transfer control unit 154 (see column 5, lines 20-59, column 6, lines 62-67, col. 15, lines 23-51 and Figs. 1 and 3-5).

Yamamoto et al. (U.S. Patent No. 6,631,443 B1) provides for a Disk Storage System Having Capability for Performing Parallel Read Operations. Discussed is a method of performing parallel execution of input/output processes by distributing the processes among plural disk units in a disk unit group. In Yamamoto, as illustrated in Figs. 1-5, the control unit 203 writes the same data to all of the disk units 204 belonging to a disk unit group 211 (multiple writing function) (see column 2, lines 38-46, column 7, line 5-12, column 10, lines 42-63).

Fujimoto (U.S. Patent Application Publication No. 2003/0182516 A1) provides for a Storage System, Disk Control Cluster, and its Increase Method. Discussed is a method of connecting a plurality of disk control clusters wherein each of the clusters includes channel interface units, disk interface units, and shared memory. A switch connects the channel interface units in the clusters and the switch has a memory within which is stored management information about the clusters which is used by the switch to route access request from the host computers to the appropriate cluster (see paragraphs 21, 22, 23, 25).

Kanai et al. (U.S. Patent Application Publication No. 2003/0204649 A1) provides for a Disk Control Device and Control Method Thereof. Kanai illustrates in Fig. 1 apparatus including a switches 5 and 6 which interconnects plural disk control units 100 to permit the transfer of data between the disk control units 10 (see paragraphs 39-44, Fig. 1).

Ohno et al. (U.S. Patent Application Publication No. 2003/0221077 A1) provides for a Method for Controlling Storage System, and Storage Control Apparatus. The first and second storage control apparatuses have a function for receiving data input/output requests transmitted from a host computer and executing the processes for a storage device. The second storage control apparatus receives the data input/output request from the first storage control apparatus (see paragraphs 135, 136, 158, 160, and 161).

Ido et al. (U.S. Patent Application Publication No. 2004/0128453 A1) provides for a Storage System. A storage unit transfers an I/O processing request issued by the host to the main storage control unit as an I/O processing for the main volume through the communication volume. The main storage unit then transfers the received request to

the sub-volume (see figure 1 and paragraphs 40, 43, 46, and 47).

b. Distinctions Between the References and the Claims

The present invention as recited in the claims is not taught or suggested by any of the above noted references whether taken individually or in combination with each other or in combination with any of the other references now of record.

The present invention as recited in the claims is directed to a storage control apparatus in a storage system including a first and second storage control apparatuses for performing a data input/output request or process to first and second storage volumes respectively. The first storage control apparatus includes a first memory for storing data transferred between the first and second storage control apparatuses, a second memory, an input/output control unit for writing data transfer information which contains a storage location of data in the first memory and a storage location of data in the second storage control apparatus in the second memory, and a data transfer control unit having a data buffer for storing data and a data transfer register for storing the data transfer information. The data transfer control unit controls data transfer between the first memory and the second storage control apparatus via the data buffer in accordance with the data transfer information read from the second memory and written in the data transfer register. When a second data transfer based on second data transfer information is being controlled while a first data transfer based on first data transfer information is being controlled, the data transfer control unit writes the first data transfer information stored in the data transfer register and data stored in the data buffer into the second memory, read the second data transfer information from the second memory, writes the

second data transfer information in the data transfer register, and in accordance with the second data transfer information, controls the second data transfer.

The above described features of the present invention, particularly the provision of the data transfer control unit as described above which controls data transfer between the first memory included in the first storage control apparatus and the second storage control apparatus via the data buffer included in the data transfer control unit in accordance with data transfer information read from the second memory included in the first storage control apparatus and written in the data transfer register included in the data transfer control unit are not taught or suggested by any of the above described references whether taken individually or in combination with each other. The above described features as recited, for example, in claim 1 are clearly not taught or suggested by Kitta which merely describes that a first cluster can issue a control instruction for controlling the input/output device of a second cluster and the second cluster in response to the control instruction conducts a processing and sends a result of the processing back to the first cluster. These deficiencies of Kitta are also evident in each of the other references described above.

Therefore, the features of the present invention as recited in the claims are not taught or suggested by any of the above described references whether taken individually or in combination with each other.

6. Fee (37 C.F.R. 1.17(i))

The fee required by 37 C.F.R. § 1.17(i) is to be paid by:

the Credit Card Payment Form (attached) for \$130.00.

charging Account _____ the sum of \$130.00.

A duplicate of this petition is attached.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (500.43504X00).

Respectfully submitted,

Antonelli, Terry, Stout & Kraus, LLP



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CIB/jdc
Enclosures